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INFANT MORTALITY.

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following the curve of infant mortality over a series of years, few tures are more striking than the contrasts which it presents. Every vement is an exaggeration. It differs in the various portions of United Kingdom. It is always higher in England than in Scot-d, although the relationship of their general death-rates is reversed. is invariably lowest in Ireland. The towns stand out in marked ıtrast with the rural districts, and yet the difference between them y not be greater than exists between the suburbs of a large town l the town itself. In the insular rural districts of Scotland the e for the decade 1891–1900 was 76 per 1000 ; in certain residential burbs of Glasgow it was only 74. These districts have little in nmon from the point of view of sanitation save the one feature of face density.

Next in interest to the contrasts which the rates present are their ints of correspondence. There is a prevailing belief that the rate stationary, whereas what in reality is occurring is an increase after period of decrease. In the Southern as well as in the Northern rtions of the United Kingdom the '70's decade marked the beginning of a decline in the rate which had not been maintained. Sanit effort had not become less, but more active, in the later years of 19th Century, and the persistence of a refractory and increasing coincident with this, fully explained the increasing attention the s ject was receiving. Yet even here there are contrasts ; for although increase has not in most of the large towns attained the level of years preceding the '70's decrease, the rate of the last decade* is increase on the '80's, and in Scotland is higher than at any previ period. And it is in the small towns of Scotland and in its mainl rural districts that the chief increase has been experienced ; fo most of the large manufacturing towns of both countries—to wh Birmingham, Dundee, and Aberdeen are to some extent exception (see Table, p. 14)—the rates for the last decade are lower than th which prevailed before the decrease in the '70's began.

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* Introduction to discussion at a meeting of the Society of Medical Officers Health, February 9th, 1906. The subject of the present discussion was reed upon some months before the proposed National Conference was ggested, and the present notes have in consequence undergone some odification—their scope, indeed, being almost wholly confined to a short mmary of the changes which may be traced in the recorded rates of veral parts of the country, together with an endeavour to indicate the uses which appear to have produced these changes, and the period of the st year at which they have occurred.

It thus becomes important to discover at what period of inf life the change has taken place, and, confining this portion of enquiry to Glasgow, some striking contrasts again are present Using as data for this the deaths in the first three years in each dec since the '70's, it is seen that while the total rate is now lower by per cent, this reduction represents a decrease of 30 per cent in proportion of deaths occurring from the sixth to the twelfth mon of 16 per cent in those occurring between the third and the si months, but a practical stability of the rate during the first th months of life.

In the later months of infant life, when the prevailing diseases h something in common with those of after years, some reduction the rate can thus be shown ; but the deaths in the first three mon are scarcely due to disease in the ordinary sense, but to defect vitality, and the whole field of ante-natal influences—cell deteriorat in the parents, whether from alcoholic excess, syphilis, or ov indulgence in the many forms to which adult life is addicted—co into view. The lowering birth-rate which began in the '70's dec has afforded the suggestion that with fewer births we are obtain a more virile race, but the permanence of the death-rate under th months scarcely supports this suggestion.

In view of the recent increase of the total rate, the causes to wh the deaths were attributed become important. Difficulties in way of corresponding groupings of disease over a long series of ye must be taken into account, but it may be shown that its cl ntributors were the diseases of digestion and of the nervous system. arrhœal disease to a large extent influenced the total volume of the mer, and meteorological conditions must be taken into account in amining the recent increase, but they scarcely answer the question ıether it was due to a returning prevalence of causes which had been re actively in operation before the decline in the '70's, or to the roduction of other factors arising from the social changes which occurring. Is nursing less practised than formerly, or are more thers less able to nurse ?

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* 1891-1900. Since then lower rates have again prevailed. See Char (p. 8) and Table on p. 18.

The bearing of the question on general hygiene is important. It part only of the reawakening interest in the defective and underfed ıong our school children, and in the inefficients among the industrial nmunity. It is gradually widening the area of preventive medicine, l adding individual prophylaxis to the problems of external vironment. This is the problem as it presents itself to Local thorities who are responsible for the nation's health. Personal pervision of the nursling has produced noteworthy results in ddersfield and elsewhere ; but the problem is how to extend to all ldren who require it the individual interest which is possible to few. To make much advance a more intimate acquaintance with conditions preceding infant deaths is required. In the first place Registration Act requires amendment so that early knowledge births may be available. Almost one-third of the infant deaths ur during the first four weeks of life ; yet in Scotland twenty-one ys, and in England forty-two, may elapse before a birth is registered. those portions of towns where the information is most required, whole period is usually allowed to elapse before the birth is istered. Dispensaries for nurslings have proved valuable in nce in increasing the intelligent interest of the mother in her child, l might with advantage be followed here. On all hands the need intelligent supervision is admitted, and there is an endless variety scope for local organizations assisting Local Authorities in the work. e problem for each town can only be reasonably approached through nowledge of its local conditions.

SCOPE OF DISCUSSION.

n this we have a general outline of the subject under review, but ne limitation of the scope of an isolated discussion is necessary. ere is common agreement that the death-rate among infants is ractory, and in many districts administrative action on more or definite lines is already being taken to reduce it. So far as these have yielded results which may be expressed in a general stateme they point, I think, with singular unanimity to the necessity systematic supervision of the nursling. This supervision may official or voluntary in character, but its best results are produ when operating through home influences. Of necessity, therefor although to some extent unconsciously—the horizon of administrat preventive medicine is being pushed outwards, and individual prop laxis is claiming assistance from its every-day activities.

It is needless to ask how far we individually—or, what is m important, how far the Authorities which we represent—may leg mately go in this direction, i.e., may legitimately place to the pu charge the cost of an effort whose object commends itself to all of but whose methods introduce an entirely new departure into domain of administration. We shall ultimately be judged by results we produce, and the reclaiming of infant lives forms but natural background as it were to the whole question of physi inefficiency in childhood and adolescence.

Moreover, the urgency of the demand and the magnitude of issues are obtaining public recognition, while few can be more consci than are the members of this Society, of apprehension lest the oa which individual effort has produced should end in disillusionm elsewhere, unless the varying circumstances of different districts a the causes of their infant deaths are kept in view.

For, while we speak of infant mortality as the sum of causes wh reach their final phases in the first twelve months of extra-uter life, we need scarcely be reminded that among them must be reckor not only some which are ante-natal in their origin, but some that even ante-conceptional, or what Ballantyne so well expresses resulting from an interruption to the chain of normal heredity, i as being due to cell deterioration or morbid heredity.

There thus opens out a phase of the problem of infant mortal which for the moment is beyond administrative methods at lea and yet some conception of its volume is essential if we are reas ably to consider the question : How much of the mortality of infa is due to causes which may be directly attacked by methods administration ?

Here, however, we are on the very borderland of conjecture, unless we are to regard mankind as wholly exempt from the operat of those laws which appear to regulate the maintenance of spec in other forms of life, the number beginning any generation m always be considerably in excess of that which reaches maturi

Regardless of the single life, yet careful of the type," is the poet's ay of expressing what the evolutionist means when he points to the sks of elimination as controlling the rate of reproduction. Many corns must fall, so that the single one which is to maintain its species ay escape. Numberless proglottides must be shed by the tapeworm order that one only may ultimately return to its human host through e uncooked flesh of the pig.

Interesting as this aspect of the question is, it does not, however, mmediately concern us, for although we cannot suggest, even pproximately, what might for lack of a better phrase be termed the atural death-rate during the 12 months of infancy, we quite recognize hat between the extremes which we know to exist there is a ufficiently large field for all our energies.

Urban and Rural Contrasts.

It has been suggested that the difference between the death-rate of nfants in urban and rural districts represents very fairly what may e ascribed to the blighting effect of urbanization on infant life. In sense this is true, but it fails to present a complete picture. In articular, it lacks the element of contrast which we know to exist etween sections of even one population. In the decade 1891–1900 he infantile mortality in Scotland was 128 per 1000 births; in its rincipal towns it was 147, and in its insular rural districts (population, 901 census, 122,788) it was 76.* In the same decade the infantile ate of Glasgow was 149, and in five of its best districts (Langside, ount Florida, Pollokshields, Hillhead, and Kelvinside—population, 901 census, 49,715) it was 74.

So that, without any assumption, here is a limited illustration that n infantile death-rate, which is little more than half the rate for the rincipal towns in Scotland, is actually being attained under such idely differing conditions of life as we know to exist among our slanders on the one hand, and in the residential portions of a large own on the other. In one sanitary circumstance only can these opulations be said to have anything in common, viz., in both the lement of surface density is wanting. But the internal conditions of ousing differ so widely that it is doubtful whether this factor can lone outweigh the disadvantages with which life is surrounded in the island population.†

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* See Supplement to 48th Detailed Annual Report of Registrar-General for cotland, 1905, p. cxiii.

† See Report to Local Government Board, Scotland, on the Sanitary Condition of the Lews, pp. 4-6 (Cd. 2616), 1905.

We bemoan a falling birth-rate, but a reduction by only half th difference between our best and our worst districts would more tha supply all we are losing by its decrease.

GENERAL VIEW.

In any general view of the question, if extended over a period o years, few features, as has been said, are more suggestive than it contrasts. It adds about 3 per 1000 to the general death-rate o individual populations, but is not always highest when the death-rat is greatest. There are features in it which suggest a rapid respons to the awakening sanitary activity of the third quarter of last century and find a parallel only in the obliteration of typhus fever in towns Thereafter, despite increasing stringency of administration, the rat creeps slowly upwards, until the close of the century shows elevation almost equal to any formerly reached. The Registrar-General' Divisions of Scotland present decennial rates which serve to illustrat this :—

SCOTLAND.*—INFANTILE DEATH-RATE IN 3 DECENNIA.

	1871-80.	1881-90.	1891-1900.	% Population (1901 Census).
SCOTLAND	123	119	128	100
Principal Towns ...	150	140	147	40
Large ,, ...	134	127	134	13
Small ,, ...	118	112	121	21
Mainland Rural ...	91	89	95	23
Insular ,, ...	81	72	76	3

The direction, quite as much as the range of movement, in the las decade is significant. It increases in all the Registrar-General' divisions ; but it is because of the increase in the small towns an mainland rural districts that the rate for Scotland as a whole is highe in the last decade than in the first. To what are we to ascribe this Is there a returning prevalence of the causes which were operativ before the '70's decade, or are other causes being substituted whic our present methods of administration do not reach ?

Broadly, does the decrease and subsequent increase reflect what i possible to external sanitary effort in the one case, and the superventio of causes which can only be met by individual prophylaxis on th other ? Here we may interpose a remark on the term " Infantil Mortality." It is a useful phrase in which to sum up the causes o death in a given period of life, but beyond that it is open to the sam jections as the phrase "Zymotic Mortality." To gauge its value e require a more rigid adherence to the groupings of disease, so that s component parts may be compared.*

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* (a) Principal Towns—population over 25,000
(b) Large Towns— ,, ,, 10,000
(c) Small Towns— ,, ,, 2,000

Among the contrasts which the curve of infantile mortality presents, obably the most striking is obtained by comparing the rates for the orthern and Southern portions of the United Kingdom (Chart I. n page 8). Ireland we know is much below both, having a rate 100 for last decade.

Although the general death-rate is higher in Scotland than in ngland, its infantile mortality rate is always lower, and the expectaon of life at birth is greater. It is possible that an age and sex rrection for both countries would equalize the general death-rate, ut this would not affect that of infants.

But while the relative elevations of the rates are thus contrasted, ere is a marked correspondence in the movement of the curve during e past fifty years. In both there is the same tendency towards ecrease in the rate during the years 1875–80, while again in both wards the end of the century the movement is upwards. This is ost marked in Scotland, where, moreover, it is associated with an crease in the rate for diarrhœal disease (see Chart II. on page 9).† he displacement of certain forms of enteritis—formerly included mong the diseases of digestion but now transferred to "general seases"—should here be borne in mind, however.

Summing up these features for both countries, it may be said that e gain during the '70's has been lost, and that during the last decade the century, especially in Scotland, a higher level than formerly as been recorded.

The decennial averages are as follows :—

DEATHS OF INFANTS PER 1000 BORN.

	1851-60.	1861-70.	1871-80.	1881-90.	1891-1900.	1901-03.
ngland and Wales	154	154	149	142	153	139
cotland	120‡	121	123	119	128	120

* The transpositions which may occur find ready illustration. "Convulns" indicate a mode of death, not its cause. Yet deaths attributed thereto come "Nervous" in classification, although in many cases they are in all obability "Digestive" (intestinal) in origin. So also "Enteritis—not fective" and "Gastro-Enteritis" must frequently require such scrutiny as ly Medical Registrars could exercise before their relegation to the local Digestive" group or to the "Diarrhœal" group of General Diseases.

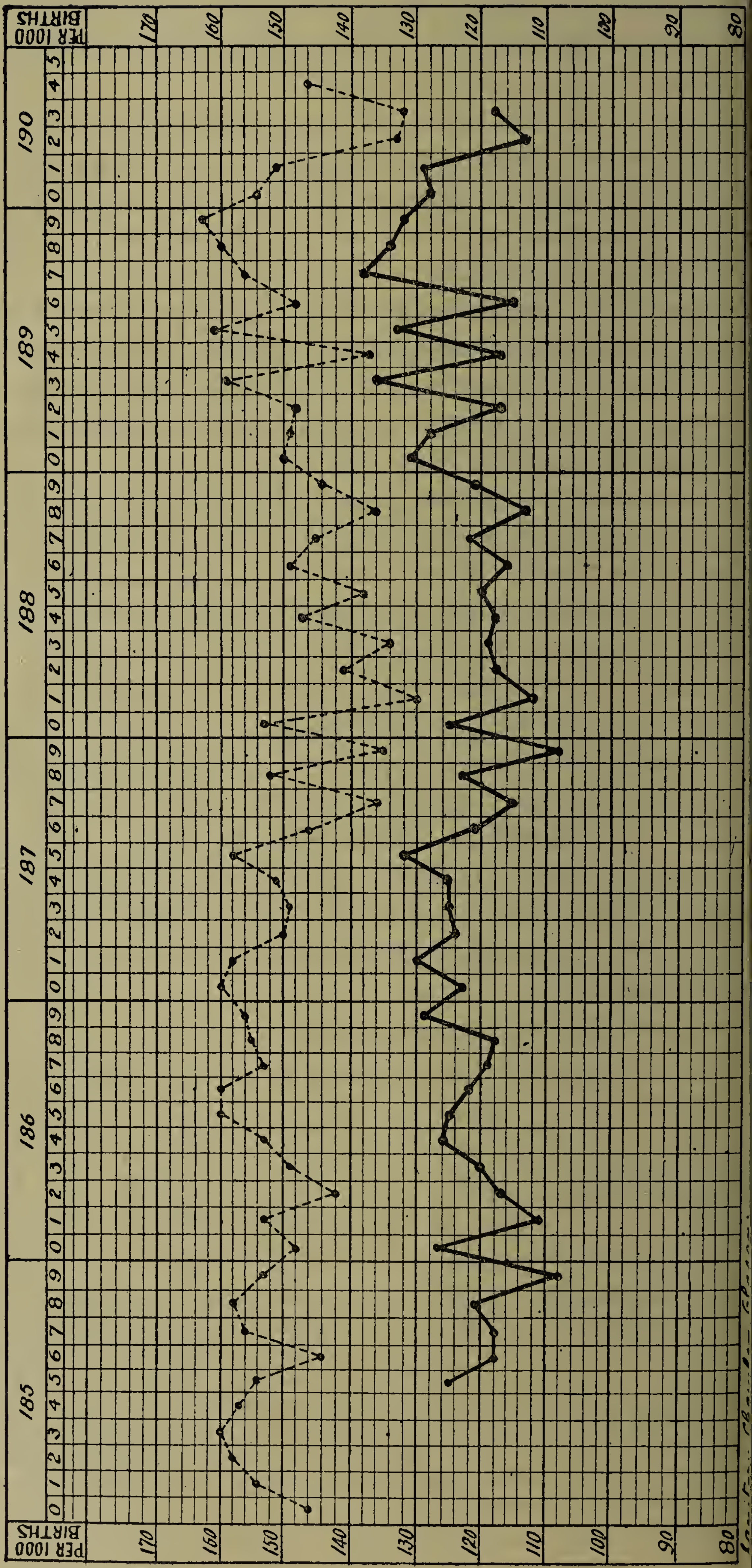
† At the foot of this Chart the curve of mean Autumn temperature (July-pt.) in Glasgow is shown.

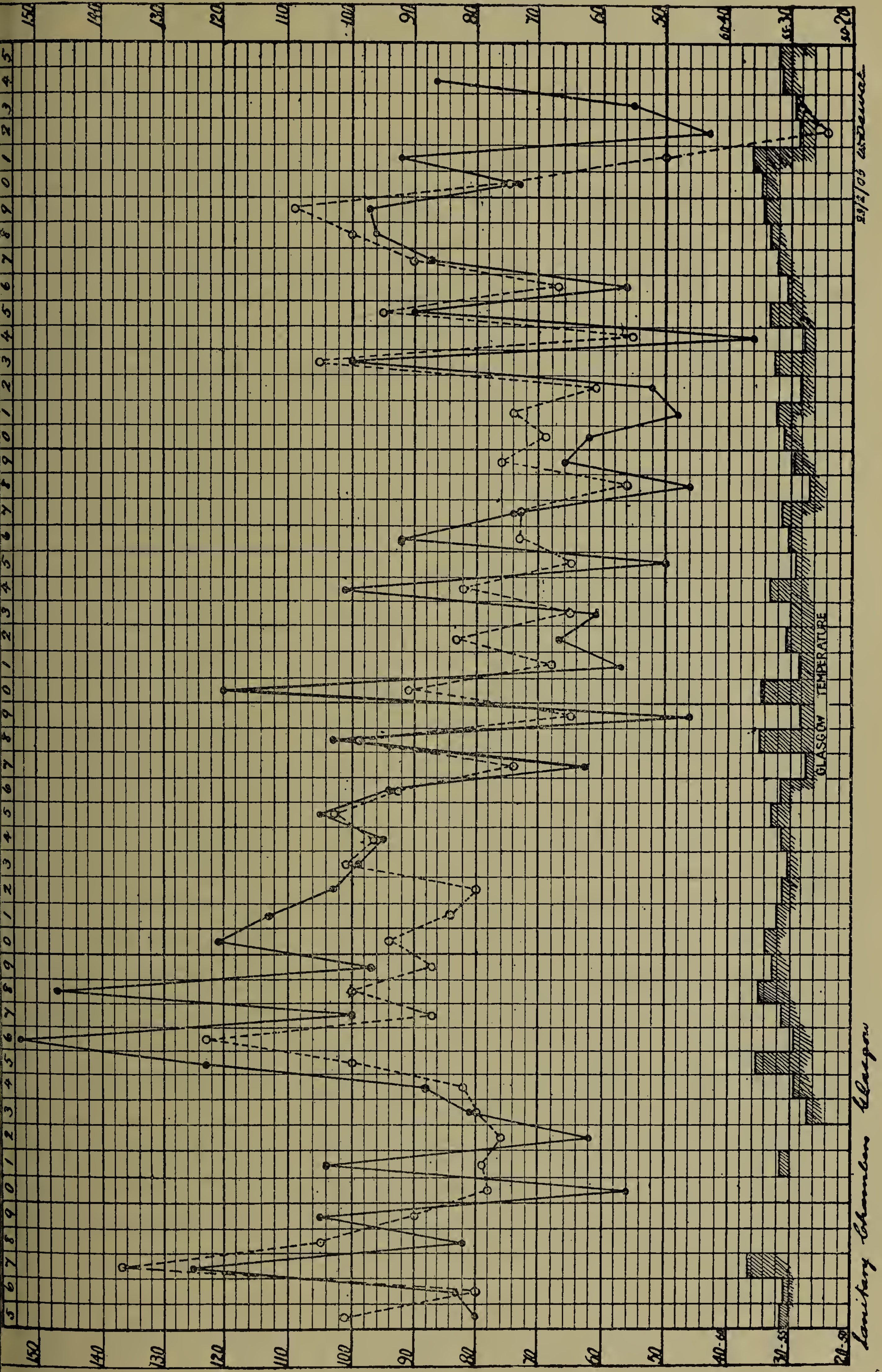
‡ 1855-60.

CHART I

INFANTILE MORTALITY 1850–1905

ENGLAND AND WALES ---- SCOTLAND ____





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The '70's Decrease.—The '70's decrease looks a comparative unimportant thing as presented in the curve for England and Scotlan but it reveals some new features when viewed in the light of what w occurring in several of the larger towns at this period (see Chart III and Table on p. 14).

Glasgow Chart, 1855–1905.—When I first looked at this chart, ready explanation of its most striking feature occurred to me. you will see, the year 1871 marks the end of a period which w characterized by high average rates, while 1876 begins a period durin which even the highest rates recorded are only slightly in excess the lowest prior to 1871. Otherwise it presents in an exaggerat way the features of the curve for Scotland, although the increasin rates towards the close of the century fall far short of those prior the '70's. In the 17 years, 1855–71, the average rate was 171 p 1000 ; in 1872–5 it was 163 ; and in 1876–1900, 147 ; while for t four years, 1901–4, the average was 143. Shortly, then, there is decline in the infant rate of 14 per 1000 between the earlier and lat portions of the last half-century.

Two questions arise here : Can we find any indication (1) of t cause of the fall in the '70's, and (2) of the subsequent increase ? have already alluded to the explanation which occurred to me in t form of the extensive clearances which took place from many of o worst districts, chiefly in the first half of this decade. But to demo strate its accuracy it was necessary to prove the absence of a fall other towns similarly situated, except with regard to coincide clearances.

Charts of Other Towns.—Charts have been constructed on the deat rates for Liverpool and Manchester (Chart III.) among English citie and for Edinburgh, Dundee (Chart IV.), and Aberdeen (Chart V among Scotch cities, and I have taken out in addition the figures f Birmingham and Leeds. Their comparison is interesting. Liverpo and Manchester display features in common with those I have describ in the Glasgow Chart. Edinburgh, also, although on a much low level, presents features which bring it rather into conformity with t towns already mentioned than with Dundee and Aberdeen, which some extent stand alone and form exceptions. In Aberdeen the lowe rate experienced was in the '70's decade—although there is litt fluctuation in the decennial rates during thirty years—but the ra for the '90's decade is considerably in excess of anything former

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* The parallel curves at the bottom of this Chart show the proporti (a decreasing one) of the total death-rate due to deaths at ages 0-1.

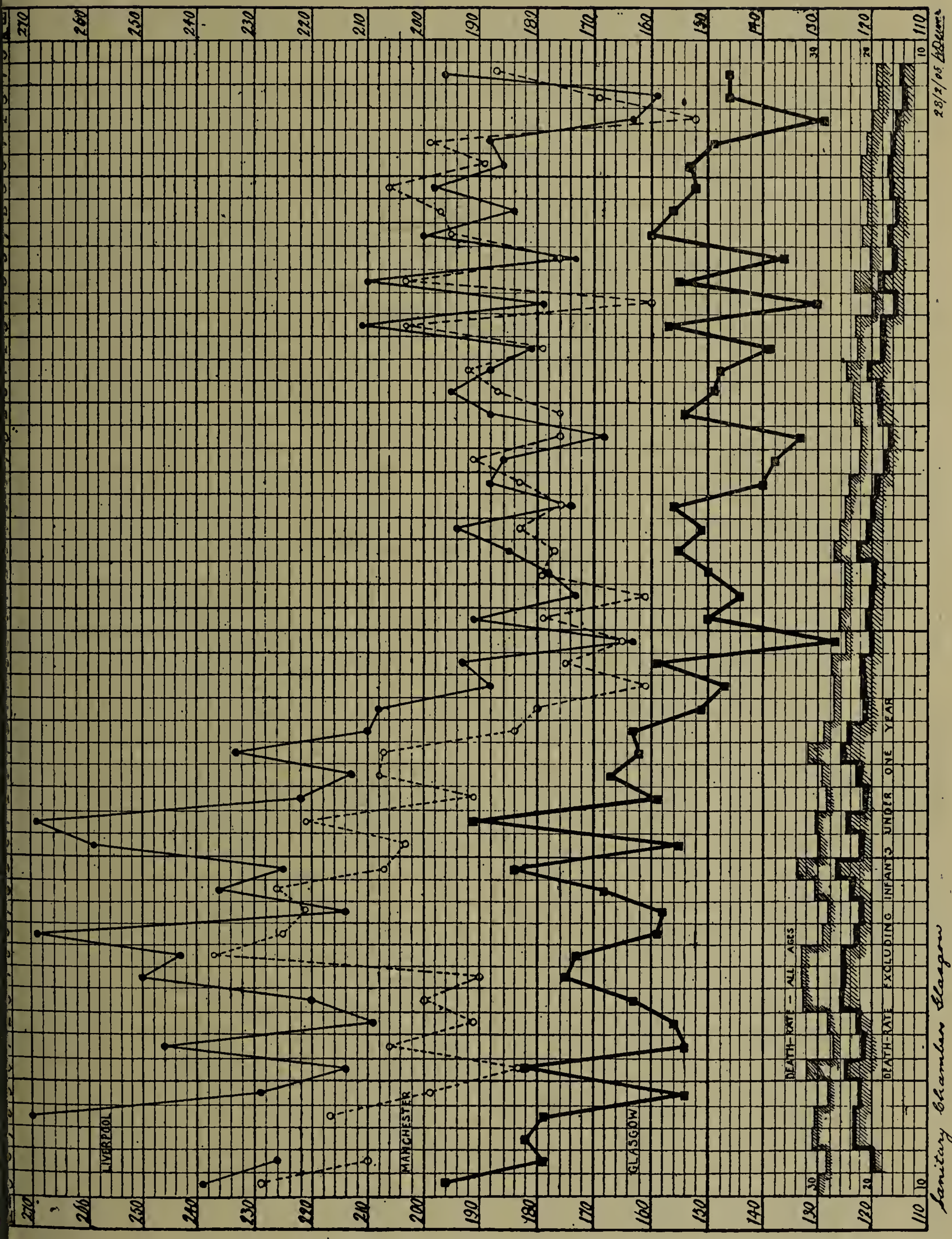
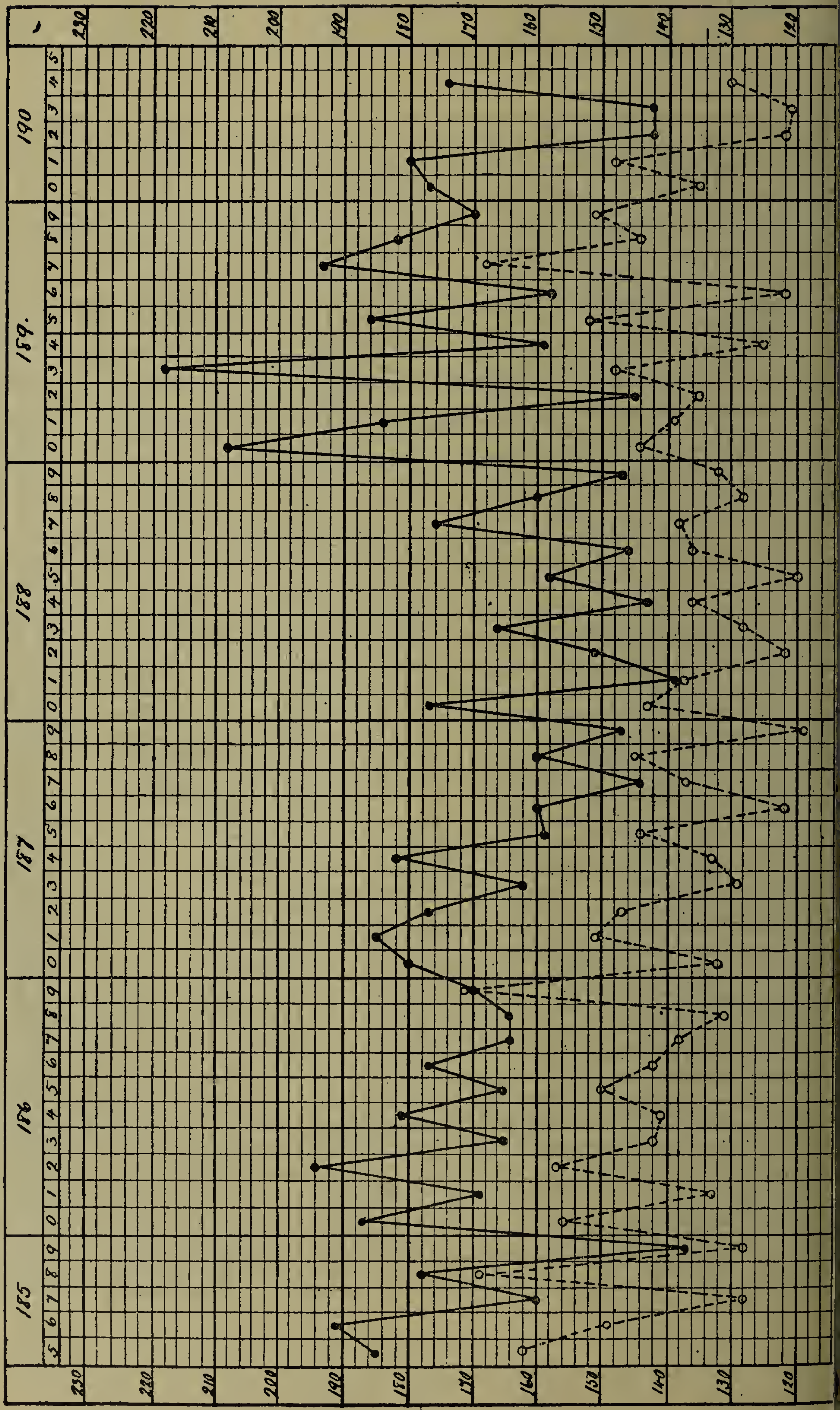
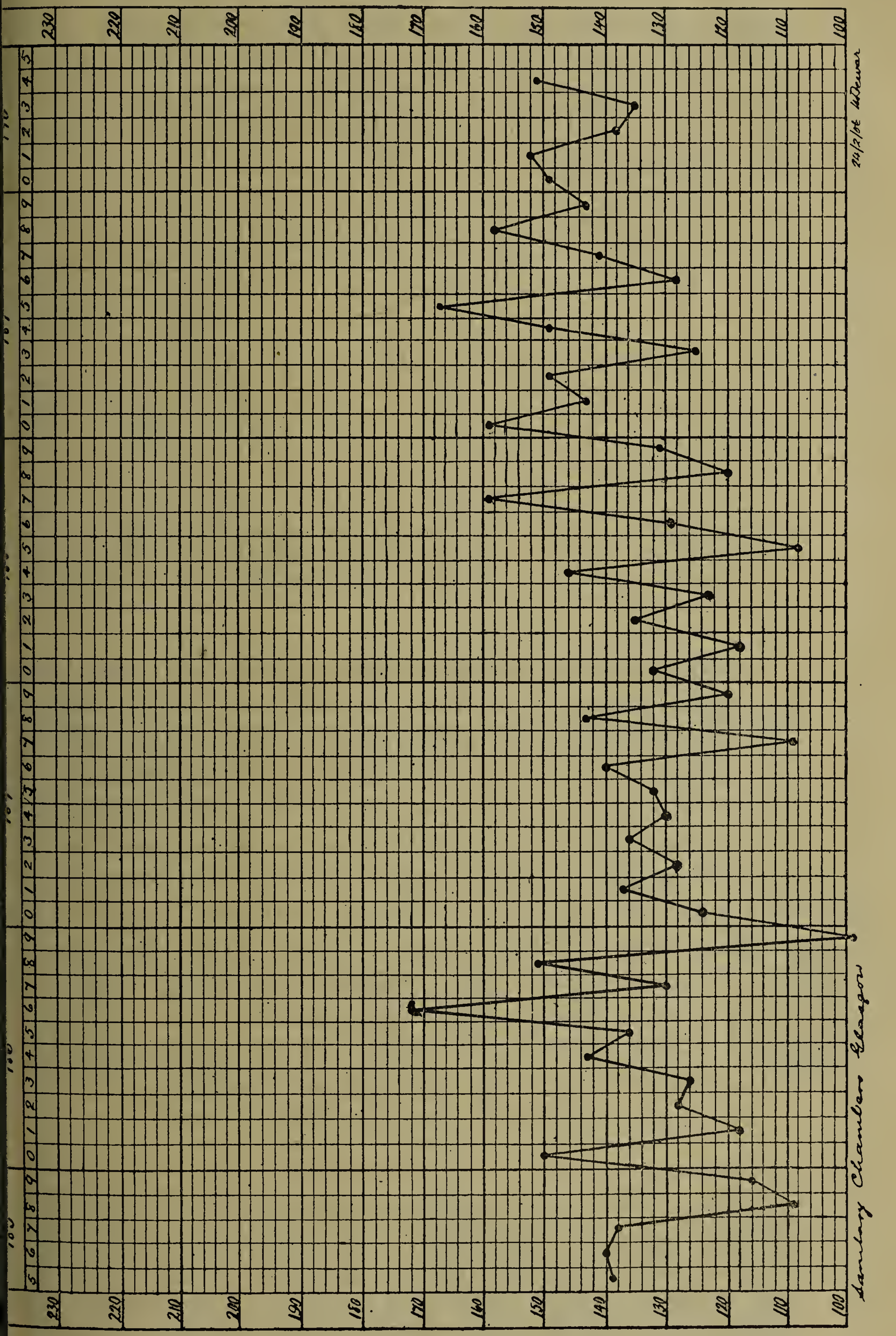

270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
LIVERPOOL
MANCHESTER
GLASGOW
DEATH-RATE – ALL AGES
DEATH-RATE EXCLUDING INFANTS UNDER ONE YEAR
30
20
10
Sanitary Chambers Glasgow
28/2/05

CHART IV

INFANT DEATH-RATE PER 1000 BIRTHS, 1855-1905

EDINBURGH-------- DUNDEE————





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reached. Dundee, on the other hand, presents something of th features which we saw characterized the small towns. This probably related to the development of the jute industry. It has, think, a larger proportion of its female population employed than an other town in Scotland. In Birmingham, also, the rate during th '90's decade exceeds that of the '70's.

TOWNS.—INFANT DEATH-RATES (DECENNIAL).

	1851-60.	1861-70.	1871-80.	1881-90.	1891-1900.	1901-04.
SCOTCH TOWNS:						
Glasgow ...	179*	165	158	147	149	142
Edinburgh ...	—	144	137	132	142	130
Dundee ...	—	173	165	159	177	160
Aberdeen ...	—	132	131	133	145	144
ENGLISH TOWNS:						
Liverpool ...	—	237	209	183	191	177
Manchester ...	—	214	185	179	190	177
Birmingham ...	—	180	182	167	187	175
Leeds	—	202	187	173	179	169

It may thus be said that in Scotland and in the great central tow of England a break in the '70's is uniformly shown. The decade w one of active sanitary reform, and it would seem as if this fall shou be regarded as one of its first results.† Notwithstanding, th suggestion leaves to be explained the rise in the later years, whi have certainly not been years of decreasing interest in sanitation, an scarcely, we think, of relaxed control. It is true that during the '7 also began the period of a decreasing birth-rate, and it has be suggested that, with fewer children born per family, there has be an increase in vitality. Two questions thus emerge at this poi which are quite distinct in their significance :—

(1) To what extent has the change in the death-rate resulted fro a lowering of the rates in particular diseases ; and

(2) Is there evidence of increased vitality in the children ?

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* 1855-60.

† In response to a query regarding the occurrence in Liverpool of a clearances, such as above referred to, Dr. Hope replies:—"We did as matter of fact effect a large clearance in the early seventies, but what, in n opinion, was far more beneficial was the abolition of common privy-midder and the substitution of water-closets for them. These middens simp consisted of channels in the earth, rendered more or less impervious by bric work, but they were of a large size and extended from one end of the stre to the other."

CHANGES IN DEATH-RATE AT CERTAIN PERIODS OF FIRST YEAR.

We have seen that a reduction of 15 per cent in the infantile death-ate of Glasgow occurred during the fifty years under review, and in rder to discover the precise period of infant life wherein this fall ccurred, I have taken out the deaths in four groups of three years t the beginning of each decade since 1871. The deaths number in ll 37,914, and the births out of which they occurred 248,659, the eaths in each three-yearly period being assumed to have occurred om the births occurring in the three years ending at mid-year in e last year of each.

GLASGOW.—BIRTHS AND INFANT DEATHS.

Period.	Births.	Deaths.			
		-3 months-	-6 months.	-12 months.	Total.
1870–2	57,549	4,135	1,799	3,863	9,797
1880–2	57,762	3,774	1,443	3,329	8,546
1890–2	60,296	4,195	1,541	3,258	8,994
1900–2	73,052	5,239	1,868	3,470	10,577
	248,659	17,343	6,651	13,920	37,914

Stating the deaths occurring in these several quarters of the first ear as a proportion of the total births in each period, we have the llowing results :—

EATH-RATE AT −3, −6, & −12 MONTHS, PER 1000 BIRTHS.

Period.	-3 months.	-6 months.	-12 months.	Total.
1870–2	72	31	67	170
1880–2	65	25	58	148
1890–2	70	25	54	149
1900–2	72	26	47	145
Per cent reduction 1870–2, 1900–2	—	16	30	15

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So that the first result of the comparison is to show that a reduction f 15 per cent in the total infant mortality resolves itself into a con-nuous reduction of the rate, now amounting to 30 per cent during e third and fourth quarters of the first year of life ; a permanence f the rate for the second quarter since 1880, although a reduction of 6 per cent when 1900-2 is compared with 1870-2 ; and an almost tationary character of the rate during the first three months of life.

Prof. Karl Pearson, as you. know, found it impossible to fit th actual curve of infantile mortality into the theoretical withou extending his view backwards over the whole ante-natal period, an the contrast here presented between the first and the third and fourt quarters will suggest something of the reason.

The difference between childhood and age is scarcely greater tha between the first month and twelve months of infant life. The disease which threaten the newly-emerging life are those which strike vertically However diverse the cause—syphilis, alcohol, dietetic excess in th parent—it is physiological unfitness in the child rather than diseas which tells mostly in the first months, while in the later months environment, in the sense of physical surroundings, comes into operation, and the diseases of infancy at this period follow more closel those of the period of childhood. Were information available on an extensive scale, as by the registration of still-births,* we shoul probably be able to make some advance in knowledge of the relationship of these early infant deaths to ante-natal fatalities, and thus begi the education of parents, which is the only direction likely to lesse this form of mortality in infants.

But, in answer to our second query, this permanence in the proportion of deaths under three months scarcely supports the surmis that with fewer births we are obtaining a more virile stock.

Variation in Death-rate of Sexes.

Another feature of some interest, although well known, is th relative fatality among the sexes at this period of life. In adult lif we are accustomed to regard the relatively higher rate among male as resulting from the greater exposure to risk which is incidental t their manner of life ; but this impression is not supported by an appea to the facts of infant deaths. The following figures indicate the rate of mortality in male and female infants respectively during the perio under review :—

Period.	Number of Deaths.		Death-Rate per 1000 Births.	
	Male.	Female.	Male.	Female.
1870–2	5,342	4,455	179	156
1880–2	4,730	3,816	161	135
1890–2	5,013	3,981	157	132
1900–2	5,919	4,658	159	130

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* The relation of still to live births has been variously stated at fro per 4 to 7 cent.

The male births always exceed the female in number, but the male nfant deaths are disproportionately greater. It is a fair enough nference from these rates that if we had information regarding the roportion of still to live births in each sex, we should find this feature rolonged backwards during intra-uterine life up to the precise point here sex is distinguishable.*

LASSIFICATION OF DISEASES FATAL IN THE SEVERAL QUARTERS OF THE FIRST YEAR.

With the knowledge that about one-half of the total infant deaths ccur during the first three months of extra-uterine life, and keeping n view the stationary character of the death-rate at this period, it may fairly be assumed that a large proportion of these deaths result, ot from disease in the ordinary sense, but from the lack of certain ital forces which make independent life difficult, if not impossible. In other words, vitality in the newly born has a negative as well as positive aspect. It is a quality of the child at birth rather than the ccident of its surroundings afterwards.

Here, however, we may appeal to the causes to which these deaths re attributed, and for this purpose I have grouped these to which the nfant deaths of 1903-4 have been ascribed. These number 3,952 males and 3,186 females.

With regard to the groupings here adopted, but specially with eference to the inclusion of " atrophy and debility " among the deaths hich are here ascribed to " immaturity," it may be urged that this erm includes deaths arising from the wasting diseases of childhood, nd related, therefore, rather to disorders of diet than to congenital efect. But while this undoubtedly is the case, the large number of eaths attributed to these causes which occurs in the early weeks eems to point to an initial defect in vitality, and the time of their ccurrence rather than the causes under which they have been egistered has been allowed to determine their inclusion in Group I. Groups III., IV., and V., must also be regarded as overlapping, ecause terms such as " convulsions, fits, etc.," have reference rather o the mode of death than its cause, and must frequently lead to the

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* Of 7,133 infants' deaths in the year 1903-4 (3,947 of which were males nd 3,186 females), 49 (48·6) % of the former and 48 (47·8) % of the latter ied during the first three months; but 31 (30·7) % of the male deaths and 9 (29·4) % of the female deaths occurred during the first month—the number f each attributable to accidents of birth bring 27 and 12, or 2·2 and and 1·2 % espectively of the numbers occurring under one month, a difference most kely resulting from the difference in size of the child, and the relation of his to the pelvic measurements.

Table A.—GLASGOW, 1903-4. MALES. INFANT DEATHS AT GIVEN AGES AND FROM SEVERAL CAUSES.

Causes of Death.	Ages in Weeks.					Ages in Months.											Totals	Group Totals.	Death-Rate per 1000 Male Births.
	1st.	2nd.	3rd.	4th.	Total.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	11th.	12th.			
I. Immaturity	607	110	89	62	868	133	98	51	33	20	20	11	13	12	11	14	—	1,284	50·7
(*a*) Premature Birth	396	55	34	18	503	14	6	3	1	2	—	—	—	—	—	—	529	—	—
(*b*) Congenital Malformations	18	6	3	2	29	2	3	1	2	—	1	—	—	—	—	—	38	—	—
(*c*) Atelectasis	18	1	2	—	21	1	—	—	—	—	—	—	—	—	—	—	22	—	—
(*d*) Atrophy and Debility ...	175	48	50	42	315	116	89	47	30	18	19	11	13	12	11	14	695	—	—
II. Diseases of Respiration ...	8	24	32	29	93	80	94	88	63	61	55	73	94	82	64	69	—	916	36·2
III. Diseases of Digestion ...	9	15	24	14	62	65	71	64	56	47	42	38	47	34	31	33	—	590	23·3
(*a*) Diarrhœal	4	8	21	10	43	55	61	58	47	40	30	33	37	28	20	26	478	—	—
(*b*) Dentition	—	—	—	—	—	—	—	—	—	3	5	1	7	3	6	7	32	—	—
(*c*) Others	5	7	3	4	19	10	10	6	9	4	7	4	3	3	5	—	80	—	—
IV. Diseases of Nervous System	30	12	19	8	69	36	27	35	21	39	25	27	32	43	27	23	—	404	15·9
V. Tubercular Diseases ...	—	—	1	—	1	4	16	14	15	12	15	17	18	22	17	20	—	171	6·8
(*a*) Tabes Mesenterica ...	—	—	—	—	—	1	5	2	2	4	3	2	5	4	3	5	36	—	—
(*b*) Tubercular Meningitis ...	—	—	—	—	—	1	6	5	8	4	6	8	8	10	6	6	68	—	—
(*c*) Other forms	—	—	1	—	1	2	5	7	5	4	6	7	5	8	8	9	67	—	—
VI. Accidents of Birth	26	1	2	—	29	—	—	—	—	—	—	—	—	—	—	—	—	29	1·1
(*a*) Injury	23	1	1	—	25	—	—	—	—	—	—	—	—	—	—	—	25	—	—
(*b*) Umbilical Hæmorrhage ...	3	—	1	—	4	—	—	—	—	—	—	—	—	—	—	—	4	—	—
VII. Infectious Diseases ...	—	2	2	4	8	16	14	18	22	22	23	39	42	43	46	45	—	338	13·3
(*a*) Whooping Cough ...	—	—	1	3	4	12	14	16	21	20	18	34	33	28	22	29	251	—	—
(*b*) Measles	—	—	1	—	1	3	—	1	—	2	4	4	9	14	21	16	75	—	—
(*c*) Scarlet Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	2	—	—
(*d*) Erysipelas	—	2	—	1	3	1	—	1	1	—	1	1	—	1	1	—	10	—	—
VIII. Syphilis	2	4	2	2	10	8	6	4	—	—	1	—	—	1	—	1	—	31	1·2
IX. Suffocation	10	3	2	—	15	9	5	3	4	3	1	—	—	—	—	—	—	40	1·6
X. Other Violence	1	—	—	—	1	1	—	—	—	—	—	1	—	2	—	—	—	5	0·2
XI. All Other Causes	22	15	13	6	56	17	8	11	13	5	6	2	10	4	4	8	—	144	5·7

Causes of Death.	1st.	2nd.	3rd.	4th.	Total.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	11th.	12th.	Totals	Group Totals.	Death-Ra per 100 Fem. Birt
I. Immaturity	453	98	85	45	681	104	77	61	22	20	15	14	8	8	6	5	—	1,021	41·6
(*a*) Premature Birth	296	49	30	16	391	24	8	1	1	2	2	1	—	—	—	—	430	—	—
(*b*) Congenital Malformations	17	10	4	1	32	3	1	2	1	1	—	—	—	—	1	—	41	—	—
(*c*) Atelectasis	14	—	1	—	15	1	—	—	—	—	—	—	—	—	—	—	16	—	—
(*d*) Atrophy and Debility ...	126	39	50	28	243	76	68	58	20	17	13	13	8	8	5	5	534	—	—
II. Diseases of Respiration ...	7	21	17	24	69	67	79	42	51	58	44	62	71	59	57	64	—	723	29·4
III. Diseases of Digestion ...	11	9	9	19	48	49	57	57	51	53	40	33	36	35	29	31	—	519	21·1
(*a*) Diarrhœal	4	5	4	8	21	38	48	50	39	36	33	27	29	25	18	26	390	—	—
(*b*) Dentition	—	—	—	—	—	—	—	—	1	1	3	—	4	3	4	4	20	—	—
(*c*) Others	7	4	5	11	27	11	9	7	11	16	4	6	3	7	7	1	109	—	—
IV. Diseases of Nervous System	21	9	14	10	54	24	33	18	26	30	19	17	17	25	21	24	—	308	12·5
V. Tubercular Diseases ...	—	—	—	—	—	5	3	5	16	10	8	13	12	17	6	17	—	112	4·6
(*a*) Tabes Mesenterica ...	—	—	—	—	—	2	—	—	2	5	1	5	—	4	—	2	21	—	—
(*b*) Tubercular Meningitis ...	—	—	—	—	—	1	1	3	9	2	4	5	7	8	4	5	49	—	—
(*c*) Other forms	—	—	—	—	—	2	2	2	5	3	3	3	5	5	2	10	42	—	—
VI. Accidents of Birth	10	1	1	—	12	—	—	—	—	—	—	—	—	—	—	—	—	12	0·5
(*a*) Injury	9	1	—	—	10	—	—	—	—	—	—	—	—	—	—	—	10	—	—
(*b*) Umbilical Hæmorrhage ...	1	—	1	—	2	—	—	—	—	—	—	—	—	—	—	—	2	—	—
VII. Infectious Diseases ...	1	3	4	6	14	20	22	21	13	19	22	35	34	38	43	45	—	326	13·3
(*a*) Whooping Cough ...	1	1	2	4	8	20	19	19	11	16	16	26	27	23	26	28	239	—	—
(*b*) Measles	—	—	1	—	1	—	1	2	2	3	6	9	7	15	17	17	80	—	—
(*c*) Scarlet Fever	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	—
(*d*) Erysipelas	—	2	1	2	5	—	1	—	—	—	—	—	—	—	—	—	6	—	—
VIII. Syphilis	—	2	1	4	7	13	7	2	3	1	—	1	—	2	1	—	—	37	1·5
IX. Suffocation	7	2	5	5	19	4	6	2	2	—	—	1	—	—	1	—	—	35	1·4
X. Other Violence	1	—	—	—	1	1	—	1	—	—	—	—	—	1	—	—	—	4	0·2
XI. All Other Causes	11	7	12	4	34	11	7	6	10	7	2	4	—	1	5	2	—	89	3·6
	522	152	148	117	939	298	291	215	194	198	150	180	178	186	169	188	—	3,186	129·7

inclusion in the group of nervous diseases of many, which, in realit belong to digestive disorders on the one hand, or meningeal affectio of tubercular origin on the other.

There are contrasts in the rates presented by the several groups each sex, but in both the number grouped as "immaturity" for about one-third of the total rate, and contribute two-thirds of t deaths occurring within the first four weeks. Next in order of fatali come diseases of respiration, and thereafter those of digestion and the nervous system. It is to be noticed that the numbers occurri from the eighth month onwards are on a higher level than those duri the seventh month, which, in both sexes, is that in which the fewe number of deaths occur.

It is during these months that the disturbances of digestion due weaning might be expected to show an increasing number of deat but the increases shown in the fourth quarter are due partly to nervo diseases, but chiefly to the infectious diseases, whooping-cough a measles.

With this grouping of the causes of infant deaths we may procee to ask whether corresponding groups can be established for form years with the object of answering the question : In what groups h decrease occurred ?

The difficulties of finding corresponding groupings are considera here. It is possible that in the earlier decades of registration ma premature births escaped registration altogether, and for classificati purposes they were not separated out in Scotland until 1877, and th were taken from the group of "atrophy and debility." In a simi manner atelectasis does not appear as a cause of death until 1883.

Keeping these changes in view, I have endeavoured to group 37,914 deaths already referred to.*

Immaturity.—In the Table the deaths attributed to the cau included in this group formed 43 per 1,000 male births and 36 1,000 female births in 1870–2, and 47 and 37 respectively in 190 being lower than either in 1880–2 and 1890–2.†

* The proportion unallocated in each period formed respectively 7·9, 6·5, and 8·4%.

† Relationship of Immaturity to other causes of Death am Infants.—A limited enquiry into the numerical relationship between inf deaths from "Immaturity" and "all other causes" suggested that the volu of the latter bore some definite relationship to those arising from immatur and that this relationship was fairly constant, even when healthy unhealthy districts were compared. Hence the number attributed to im turity could be regarded as an index to the total volume of deaths wh would occur during the first year of life in a given district,—the suggesti indeed, being that immaturity expressed not only the cause in individual ca but was also the expression of susceptibility to disease, which would pr fatal to a definite number of the others.

GLASGOW.—INFANTILE MORTALITY (MALES AND FEMALES), EATH-RATE PER 1000 BIRTHS FOR SEVERAL GROUPS OF DISEASE.

Causes of Death.	1870-2.		1880-2.		1890-2.		1900-2.	
	M.	F.	M.	F.	M.	F.	M.	F.
I. Immaturity	43·2	36·0	41·3	32·7	40·2	35·2	46·8	37·3
II. Diseases of Respiration...	46·2	37·3	40·1	32·9	41·3	32·3	33·9	29·2
II. Diseases of Digestion, including Diarrhœa ...	27·7	23·2	20·0	17·6	21·6	18·8	25·0	18·8
IV. Diseases of Nervous System	12·7	10·6	14·2	11·2	17·5	13·0	16·6	12·3
V. Tubercular Diseases ...	17·0	15·7	13·3	10·6	7·6	6·2	6·8	5·3
VI. Accidents of Birth ...	—	—	—	—	—	—	0·7	0·5
II. Infectious Diseases ...	17·3	17·7	15·0	16·2	16·6	16·3	13·8	13·9
II. Syphilis	1·9	2·0	2·9	2·0	2·4	1·6	1·8	1·4
Unallocated	13·0	13·8	14·0	11·5	10·2	8·8	13·2	11·2
	179·0	156·3	160·8	134·7	157·4	132·2	158·6	129·9

Diseases of respiration have declined from 46 per 1,000 for males d 37 for females in 1870–2, to 34 and 29 in 1900–2.

Diseases of digestion.—In 1900–2 these were lower for both sexes an in 1870–2, but greater than in the intervening periods, especially r males.

Diseases of the nervous system are now greater for both sexes, and ould probably be read together with the diseases of digestion.

Tubercular and infectious diseases are both lower than formerly in nsonance with the movement of the death-rate for these diseases all ages.

NDITION OF NEWLY-BORN CHILDREN WITH REFERENCE TO THE HEALTH OF THE MOTHER DURING PREGNANCY.

An opportunity occurred during last winter of making enquiry to the condition of recently-born children, with reference to the alth of the mother in the previous months. The limit of registration births in Scotland extends to twenty-one days, and the custom of the erage parent or guardian seems to be to take full advantage of the terval, because, in an arrangement with registrars to obtain early in- rmation of births registered, we found that it was usually the fourth eek after birth before the enquiry could be made. Consequently, of 8 births which were enquired into, in 44 cases no information could obtained, either because the families had removed or were not found the time of visit; 12 were dead, and 46, or almost 22 per cent the 212 remaining, were found to be badly nourished.

Underfed in Relation to Condition of Mother.—Grouping these 21 children according to their condition at the time of enquiry and th relation of this to the manner of feeding, the proportion of childre who were badly nourished on breast milk is more striking than th proportion fed artificially.

Condition.	Nursed.		Artificially Fed.	
	Number.	Per cent.	Number.	Per cent.
Well nourished	51	80	5	64
Fairly ,, ...	97		13	
Badly ,, ...	36	20	10	36
	184 = 87%		28 = 13%	

There is little evidence here of a desire on the part of mothers t deliberately sacrifice the interest of the child to their own convenience It is the 20 per cent of nurslings who were badly nourished, a con siderable portion of the 53 per cent who were only fairly nourished and all save 18 per cent of the artificially fed, which reveal the magni tude of the work lying before us in the effort to gain for these childre a fair chance of surviving their first year. In France, as most of yo are aware, a movement has lately been begun for feeding the mother of indifferently-thriving children, and the effort has at least a rationa basis.

Reasons for Artificial Feeding.—Notwithstanding the limited scop of the enquiry, the statement of reasons for having recourse to artificia feeding is not without interest. Of the 28 artificially-fed children 18 were legitimate and 10 illegitimate. In 7 of the former and 8 o the latter the mothers were working out and unable to attend to th children.

Condition of Mother.—In 19 of the 46 badly-nourished children, i was ascertained that the mother had been working out during he pregnancy, that in 9 of these it was associated with insufficient food and in 7 this was combined with the use of alcohol or malt liquors In 15 the father was in irregular employment. Eighteen mothers wer ascertained to have had insufficient food during their pregnancy, 1 were in bad health during the whole time, and in 27 the father was i irregular employment.

Few things were more suggestive in this enquiry than the tale o children dead in families in which those badly-nourished childre re found. In the 46 families the total births numbered 243, or ther more than five to a family, but of these, 85 children, or 34·9 r cent, had already died during infancy or childhood.

Points Suggested for Discussion.

At almost every step of the enquiry there is lack of precise and early formation of the circumstances which precede infant deaths, and to complish this I suggest the following points for discussion. (It ould be remembered that the Midwives Act does not extend to otland.)

(1) The earlier registration of births, and registration of still-births.*

(2) The establishment of dispensaries for nurslings.

(3) More extensive information of a clinical character regarding the tritive value of pasteurized as against sterilized milk ; and the etetic value of the various infant food stuffs in the market.

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* Since August of last year we have had an arrangement in Glasgow by ich out-door births attended by the staff of the Maternity Hospital are timated to me within 48 hours of their occurrence ; but there must be a ge proportion of births unattended either medically or by any nursing ff, and it is probable that these are the most desirable to be known.

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